

# Project Patchwork - Wirelessly Networked Structural Analysis Devices for Aircraft, Phase I

Completed Technology Project (2018 - 2019)



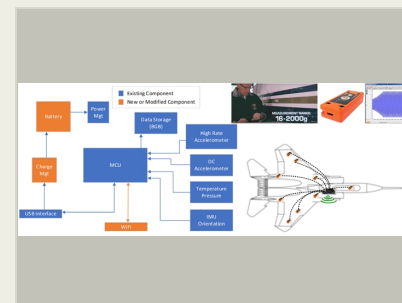
## Project Introduction

Through this SBIR effort, NASA is looking for innovative technology to bolster its flight research capabilities. Particularly, NASA seeks the development of innovative measurement and data acquisition approaches. Mide through a past RIF BAA for Navair, developed a stand-alone high performance data logger for vibration/acceleration, pressure, and temperature. The device, dubbed the Slamstick X, was designed to support F/A-18 flight-testing, and in particular to measure structural vibrations in the aircraft in order to diagnose potential problem areas in the vehicle to guide repair and maintenance needs without the time and cost of traditional wired data acquisition approaches. Mide proposes to develop a wirelessly connected nodal Slamstick array (via wifi). Data from the wifi-enabled Slamstick loggers will be fed to a centralized sbc, base station computer, or flight computer for a more holistic real time estimation of aircraft and sub-component health during aircraft tests.

## Anticipated Benefits

NASA is very active in aircraft flight-testing, aero-structural testing, simulation, and supporting scientific research with its active test bed aircraft. The proposed effort will be useful for flight testing, lab testing, and possibly for simulation. The Slamstick devices will provide structural information throughout the aircraft, but also provide other data on demand such as pressure and temperature, and inertial measurements via onboard IMU.

Any aircraft or spacecraft test facility could benefit from the development of a wireless Slamstick network architecture. Unmanned aircraft may especially benefit, if health management approaches can be fully hard wired. The effort will be very beneficial to the Air Force and Navy. Automotive testing, and shock testing could also benefit. Industrial applications/plant wide monitoring and process monitoring could also be of interest.



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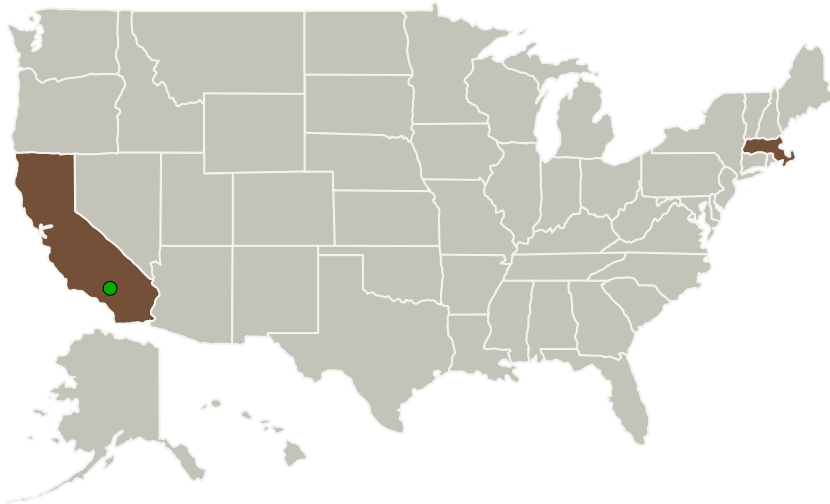
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## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Mide Technology Corporation	Lead Organization	Industry	Medford, Massachusetts
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	Massachusetts

## Project Transitions

**July 2018:** Project Start

**February 2019:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137886>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Mide Technology Corporation

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

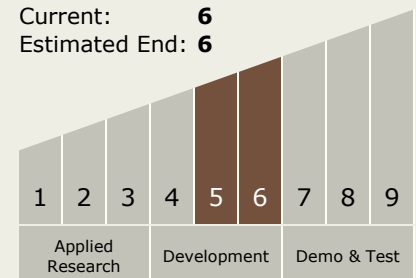
Carlos Torrez

### Principal Investigator:

Noel J Keegan

## Technology Maturity (TRL)

Start: **5**  
Current: **6**  
Estimated End: **6**

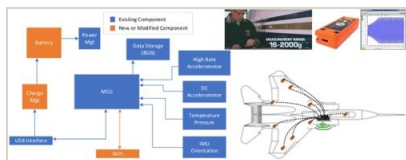


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## Images



### Briefing Chart Image

Project Patchwork - Wirelessly Networked Structural Analysis Devices for Aircraft, Phase I  
(<https://techport.nasa.gov/image/137207>)



### Final Summary Chart Image

Project Patchwork - Wirelessly Networked Structural Analysis Devices for Aircraft, Phase I  
(<https://techport.nasa.gov/image/130336>)



### Final Summary Chart Image

Project Patchwork - Wirelessly Networked Structural Analysis Devices for Aircraft, Phase I  
(<https://techport.nasa.gov/image/126832>)

## Technology Areas

### Primary:

- TX15 Flight Vehicle Systems
  - └ TX15.1 Aerosciences
    - └ TX15.1.6 Advanced Atmospheric Flight Vehicles

## Target Destination

Earth